

BIS Information Technology Strategic Plan 2021-2026 (Final-Public)

OFFICE OF THE CHIEF INFORMATION OFFICER

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Letter from the CIO

In the 1960s a football coach named Bill Walsh designed a system to optimize the passing game. At the time passing was considered inferior to running the football. He'd continue to leverage system thinking to iterate on his West Coast Offense, changing the way football was played. When Walsh took over the failing 49ers, he first started with buy-in from the whole organization to change. From there he evolved their system of play, taking the 49ers from the bottom of the league to Superbowl Champions in a few years.

When I arrived, in June 2020, at the US Department of Commerce-Bureau of Industry and Security (DoC-BIS), I found legacy technology from decades past. BIS devices ran a deprecated Windows 7 OS and application systems dated back to the initial introductions of IT usage within the Federal Government. The organization's technology environment was held together by dedicated civil servants willing to patch any problem in support of the mission using "Macgyver" solutions when necessary. However, the office lacked a cohesive and strategic plan to continuously evolve, modernize, and move forward. This was an opportunity much like Walsh had with the 49ers. Bureau leadership recognized the importance of thinking bold, a philosophy I ascribe to and even inscribed on my challenge coin (The G. Coin) "Fortune Favors the Bold." Together we will embrace innovation, foster collaboration to break down silos, and enable a true agile DevSecOps pedagogy.

In developing a vision for IT modernization and transformation, the goal was not solely to catch up to status quo, but leapfrog into the future. We knew BIS's mission was heading into a new operational landscape. Sure enough, the increasing criticality of the role and scope BIS played in regulatory frameworks and national security was recognized by our nation and policy thought leaders. Therefore, the IT Strategy Plan reimagines an OCIO system that provides robustness to the BIS business, while supporting the overarching DoC mission of getting the job done right under the current extraordinary and empowering leadership at the agency and the bureau.

At the highest level, our foci include:

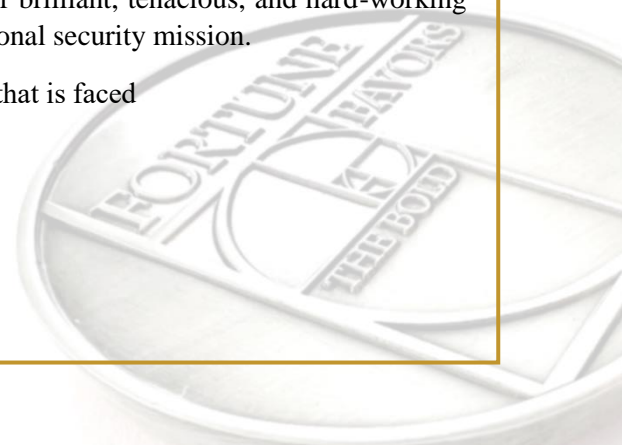
- Flexible and adaptable IT so our business can maneuver the same
- Understanding and cultivating a healthy data ecosystem
- Organizational change in posture, resources utilization, and culture

All forward progress is wrapped in modernized security design paradigms and a focus on CX-360. BIS OCIO is evolving into a versatile partner that programmatic offices can depend upon. We've identified and articulated goals for the next five years. These goals drive system thinking designs which are balanced to compliment the organizations' mission. DoC-BIS's strong leadership and quality people both attracted and humbled me. I see the path that we, as a team, can achieve. I am honored to lead and serve our brilliant, tenacious, and hard-working team members through this collective evolution, supporting a critical national security mission.

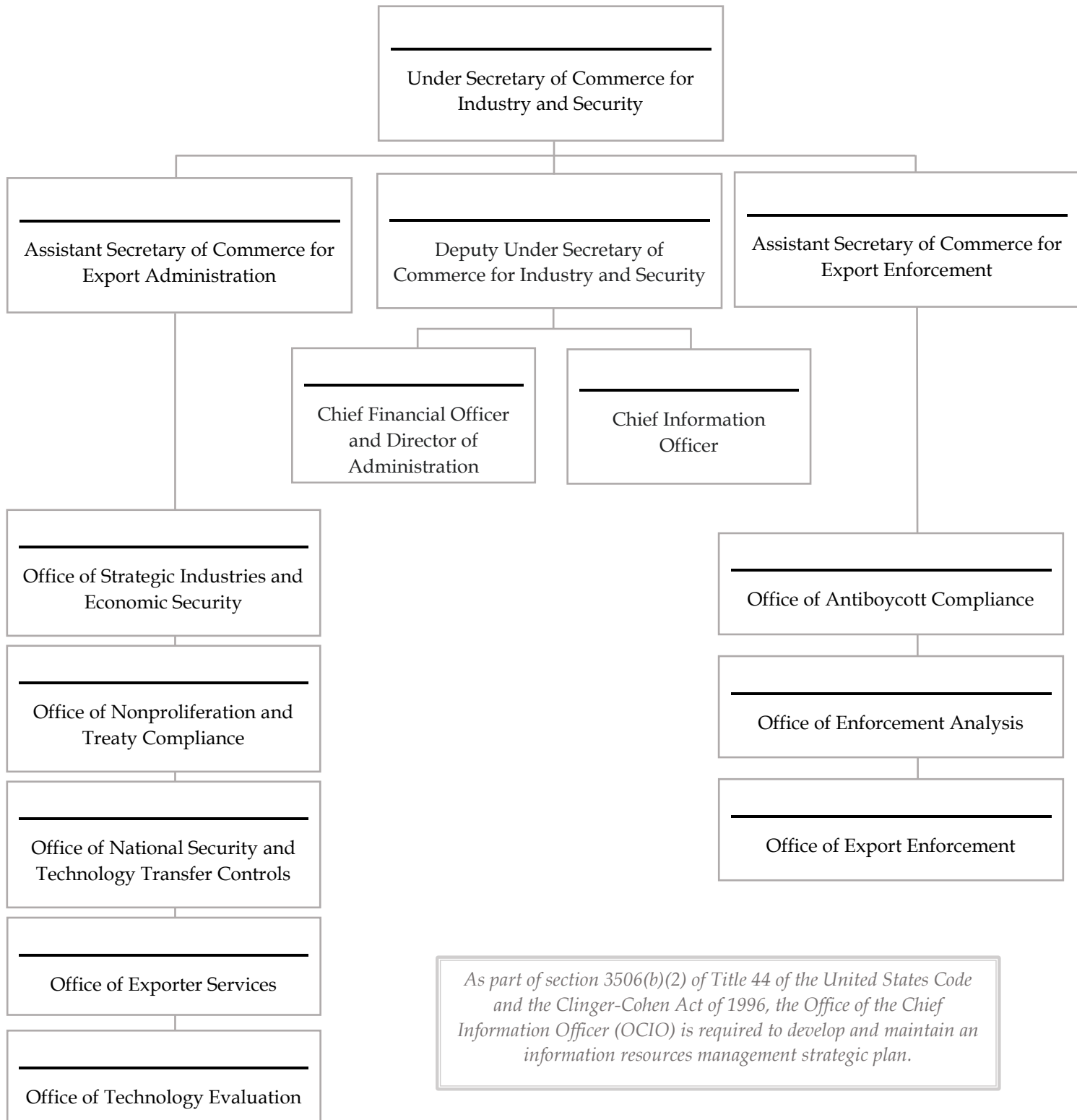
In closing, I cite the immortal words of James Baldwin "Not everything that is faced can be changed, but nothing can be changed until it is faced."



G. Nagesh Rao
Chief Information Officer
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Bureau of Industry and Security



Section 1: EXECUTIVE SUMMARY

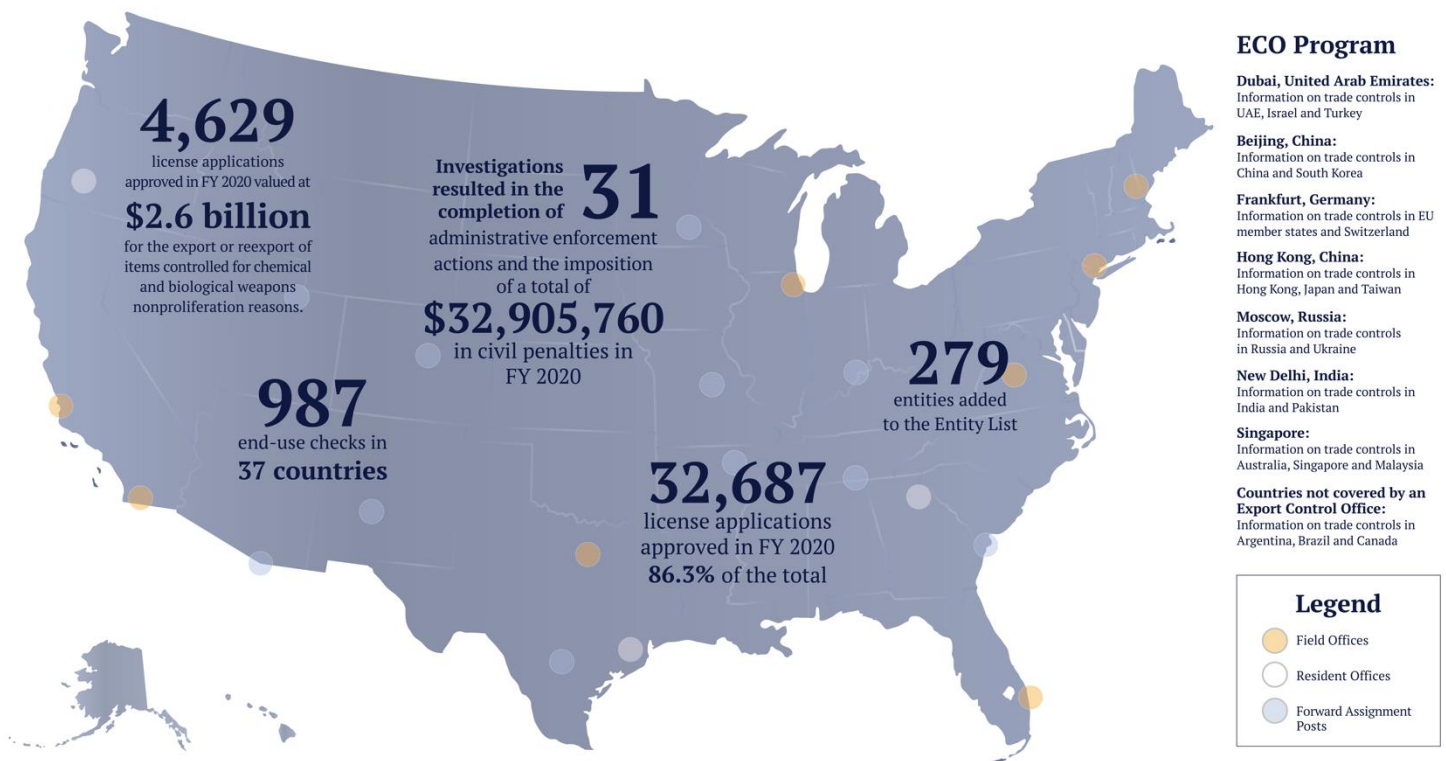
Bureau of Industry and Security (BIS) Mission Supported by Technology

BIS's efforts over the next few years will maximize the effectiveness of export controls and promote continued U.S. strategic technology leadership. BIS OCIO must strive to reflect the country's technology leadership in its own application of technology to the regulatory and business practices supporting the mission.

Organizational evolution involves changes not only to the technology itself, but the structure and strategy in how technology is integrated into the business. Technology is critical to supporting the regulatory and enforcement environment as it adopts to the constantly changing tactics and adversarial use of tech. Technology is necessary to streamline and optimize regulatory and business processes. Technology is needed to enhance and maximize collaboration with current and new stakeholders, both domestic and international. And technology and data are foundational to enhancing decision making, compliance, and analysis required for top performance.

The mission needs of BIS inspires OCIO to become a preeminent technology partner, primed to ensure our bureau remains a linchpin tool for policy makers. As the environment where policy and action increasingly require both speed and finesse, OCIO needs to ensure the organization is supported technologically to execute effectively and accurately.

Our future vision is described in the following sections. We hope this strategic plan, alongside a solid framework from which to operate, will lay the path for BIS OCIO's evolution over the next five years and beyond.



Section 2: VISION

1. Alignment

This **BIS Information Technology Strategic Plan** is a 5-year outlook to transform BIS OCIO into a leading technology partner for BIS' mission. The plan is designed with strategic goals and objectives that align the investment and modernization efforts in support of BIS' mission. This approach looks beyond current standards and reimagines the organization as it must be years into the future, with direction that continues well beyond 5 years.

The Information Technology Strategic Plan aligns to the projected BIS business needs. Appendix A cross references the objectives to the BIS strategic plan. The Information Technology Strategic Plan will be a tool for BIS to guide the direction, development, architecture, investment planning, workforce management, organizational change, and accountability of the BIS Information Technology (IT) community.

Over the next five years, BIS OCIO will strive to maximize the value of technology and data supporting the BIS missions, partners, workforce, and ultimately the American people.

“This approach looks beyond current standards and reimagines the organization as it must be years into the future.”

1.1 Role of IT in BIS

BIS OCIO recognizes that in our effort to catch up to the modern state of technology, we have a choice to meet the current status quo or leap into the future. This plan represents our vision of how an OCIO works with and for the Bureau of Industry and Security.

The OCIO wants to move from a shared service provider to a valued technology partner for the Bureau. The distinction is a service provider's end goal is maintaining service standards while a partner's goal goes beyond to being a trusted and proactive team member.

The change needed in OCIO is less about technology solutions and more around how OCIO and BIS are working together organizationally and culturally to take advantage of commercially available technology.

How might BIS OCIO go beyond standard IT services?

- Enable EE and EA to quickly adapt to changing needs.
- Proactively upskill for technology across the Bureau.
- Focus on the technology experience not just features.
- Provide transparency and robustness in our business practices.
- Provide clean and accessible data for analysis and reporting.
- Advise on how to best solve business problems with technology.
- Future proof the organization instead of locking BIS into decade long technology cycles.

1.2 IT and OCIO Future Outlook

While the Bureau's mission remains steadfast, the technology landscape in which we operate is rapidly changing. Bad actors are incentivized to adapt faster than our regulatory and enforcement capabilities and leverage technology to stay ahead.

The Bureau needs the ability to adapt as quick, if not faster than malign actors, all while maintaining the

bedrock stability necessary in federal government. BIS OCIO considers this dynamism created via technology and tech/data organizational processes, and therefore an OCIO responsibility.

2. Principles

2.1 Guiding Concepts of Modern IT

1. Technology needs to be adaptable, extensible, and focused on the omni-customer experience
2. Technology amplifies what we do but cannot replace us.
 - Speed
 - Scale
 - Quality
3. People are the variable, problem, and solution to every system.
4. Data is an ecosystem and must be treated as such. Creation, architecture, and extraction all contribute to the health of the data ecosystem.

2.2 Vision & Mission

The Federal OCIO of the future needs to be more than just a service provider, they need to be a trusted partner to ensure technology capabilities are factored into supporting the mission. Current OCIOs tend to be first security regulators for their agency, second budgetary gates for which to control IT investment, and third a supplier and manager of technology assets. Few OCIOs truly advise, lead, or partner in ways that enhance the business vs. control the business. Our vision of an OCIO is one that is

proactive, adaptable, and integrated into the business of BIS.

Mission: Develop BIS OCIO into an organization that empowers the Bureau's business with technology, ensures BIS remains adaptable in a dynamic operational environment, and future readies the organization's technology and data.

2.3 IT as a Living Organism

Information Technology aligns similarly to the actualization of an individual. As the technology support, services, and integration improves, the organization can focus on higher order problems. We visualized this in figure 1 in a Hierarchy of Needs diagram.

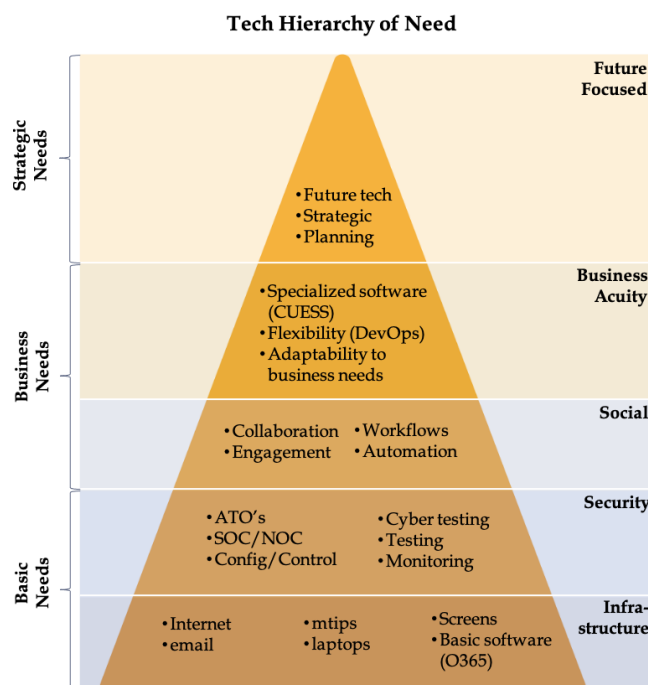


Figure 1 - Rao's Tech Hierarchy of Needs

After 20 years of technical debt, our first year reimagining BIS OCIO work means we are still primarily focused on the bottom three levels. Our sights and planning are working on level 4, the Business Activity. The way we know we've achieved our vision is when OCIO can seamlessly run the basic needs, adaptively operate the business level, and partner and advise on the strategic level.

"Our vision of an OCIO is one that is proactive, adaptable, and integrated into the business of BIS."

Section 3: GOALS AND OBJECTIVES

Goal 1: Healthy Data Ecosystem

BIS's mission starts with data. As a regulatory licensing and enforcement bureau, BIS needs to collect and properly analyze extensive amounts of data to effectively accomplish the mission. Organizationally we need to transition from our historical view of data as discrete, individual pieces, divided up by system or program, into a view of everything being a part of an ecosystem. The Data Ecosystem.

Much like natural ecosystems, health is dependent on the interconnectedness and health quality of each "species." A well-built and cultivated data ecosystem provides antifragile benefits to the organization along with abundant opportunities for developing intelligence. As the foundation for licensing and enforcement, a healthy data ecosystem is what will support future business needs like scale, automation, bad actor identification, and resource rationalization.

To ensure a healthy data ecosystem in BIS, we are looking to establish three main objectives over the next five years. First is developing an Enterprise Data View. This entails taking the fundamental business data critical to the organization and framing out how the pieces fit together. The view will provide data mapping requirements as system modernization occurs. It also identifies expanded collection opportunities to enlarge the data ecosystem for potential business opportunities.

The second objective is to develop a data strategy play. This play will put in place the framework for data around architecture, strategy, and thinking - establishing how the data ecosystem will develop. We cannot foresee the technology, decisions, or tradeoffs that BIS will need to make in the future, but we can outline the principles and frame fundamental thinking into a play that helps BIS cultivate their data ecosystem as a mature, data centric organization.

The third objective is to modernize our data collection and analytics. With 14 systems to update and cutting-edge data analytic tools on the market today, making well-founded, long-term investments that align with the first two objectives will be critical to BIS's future positioning as an analytic powerhouse for national security.

Objective 1.1



Develop an Enterprise Data View

The Core Business Data Model

Objective 1.2



Develop a Data Strategy Play

For inclusion in the BIS National Defense Digital Strategy Playbook

Objective 1.3



Update Data Collection & Analytics

A series of modernization efforts across multiple applications and technologies.

Goal 2: Rapid Tech Operations

BIS is tasked with regulating a rapidly changing set of commercial industries. Staying ahead of the curve is imperative to success. As customer's OPTEMPO increases due to technology, so must BIS's ability to adopt to those changes at scale. Technology will need to provide those abilities and that requires an OCIO to support a dynamic business environment. OCIO needs the correct technology, process, and human capital structure to carry out Rapid Tech Operations.

OCIO recognizes being in the cloud and being designed for the cloud are two very separate postures. We are looking to the rapid development opportunities of services platforms to bring the full scalable and adaptable potential of the cloud to BIS. Specifically, the low code, configuration driven platforms coming from the commercial sector provide incredible coverage of the core business needs and processes required in BIS. For the minority of specialized tasks, the platforms can be customized, or contain standardized interoperability allowing the enterprise architecture to remain connected yet simple.

BIS OCIO is driving toward the Agile methodology as the backbone of our philosophy and processes. From a DevSecOps standpoint the value is well documented to support the Rapid Tech Operations goal. The organizational change in thinking will drive the rapid adaptability of our technology. OCIO's change to Agile allows BIS the technological processes and mentality to operate in a dynamic national defense environment.

Finally, OCIO will outline an organizational restructuring designed to focus on customer experience. In restructuring we will increase efficiency and provide an overcollateralization of capital for growth needs. OCIO needs a capex mindset to remain atop the technology currents. OCIO will move out of a reactionary, firefighting mode, to a proactive, adaptable organization.

Objective 2.1



Drive Agile Practices

Iterative processes, quick development, and Lean. All leading to a rapid development OPTEMPO

Objective 2.2



Rapid Development Technologies

Ensure the enterprise architecture and technologies are interoperable, primarily configurable, and extensible. Start replacing technologies with those that can operate in a rapid development and dynamic environment.

Objective 2.3



Organization Restructure

The right people in the right places. Centralized around CX360 with Security, Infrastructure, DevSecOps, & Data practice leads.

Goal 3: Adaptive Design

The only assurance in technology is it will quickly change. Unless BIS wants to continuously operate on legacy technology, we need an Adaptive Design mentality. When it comes to OCIO's technology decisions, this means a very different architecture than what we currently operate. OCIO's goal is an adaptive technology design that allows BIS to leverage the speed and scalability with stability in the core business infrastructure. We plan to achieve this by driving toward four main objectives.

First, a technology stack designed for change. We see the move to configuration-based platform technologies as an opportunity because the changes BIS needs are not generational leaps, but quick adjustments and optimizations to an ever-moving target. These technology choices will become the backbone of our architecture ensuring both flexibility and stability of our system's design.

Second, interoperability across all systems. Today's commercial offerings represent huge opportunities for specialized technologies, however, fitting unique tech into the larger architecture can create custom dependencies which later turn into heavy technical debt. BIS needs to create interoperability standards to alleviate many of the integration issues, along with a process that reduces technical debt as periphery technologies come in and out of the core technology stack.

Third, design an open and extensible architecture plan. This will allow for growth and evolution of the technology without the need to redesign the architecture every time features change. There is no single technology that is future proof, however this Adaptive Design provides longevity of the overall system architecture.

Finally, BIS OCIO thinking, and operations remain agnostic to the technology it employs. If change is our only constant, then specializing in a specific technology choice entrenches the organization. It is not possible to be completely agnostic, but as a principle and in our cultural development, we strive to favor our processes and people to be agnostic as much as possible.

These objectives, when taken as a whole, will frame out the adaptive strategy, providing the underpinnings required for BIS to remain adaptable to the changing business landscape.

Objective 3.1



Design Adaptable Tech Stack

Flexible to changing business needs.

Objective 3.2



Create Interoperability Standards

Ensures the whole of the architecture works together instead of being siloed.

Objective 3.3



Plan Open Architecture/ Extensible Design

Future proofing to integrate advances in technology.

Objective 3.4



Cultivate Tech Agnostic Operations

Ensures the people and processes are not entrenched in single vendor skills.

Goal 4: Drive Collaboration with Tech

Collaboration is critical to BIS success and increasingly reliant on the right technology solution. Interagency policy ideation via the Federal Chief Information Council, data-collaboration via the Chief Data Officer's Council and technology goal-aligning with peer bureaus within the US Department of Commerce via the agency's impressive Chief Information Officer's Council has been vital for BIS's growth and evolution. Examples range from email and online meetings, collaboration across business processes, and data sharing and analysis. External to BIS, the OCIO is responsible for data integrations with other Federal agencies. These integrations and collaborations need to work seamlessly so BIS can utilize, share, and collaborate with our federal partners. Additionally, the public needs fast, accurate, and customer friendly services across our licensing and regulatory checks. These range from easy-to-use guides, videos, and in person training to intuitively designed application processes with easy self-service options.

OCIO's goal is to amplify collaboration on three separate levels in order to enhance our business posture. The first step is co-locating key OCIO leadership and staff among the BIS teams. Literally working beside co-workers not only drives comradery but enhances our staff's understanding of the nuanced technical needs occurring in the day-to-day work. OCIO staff will be able to advocate better for their neighbors when it comes to technology and data.

OCIO continuously works to enhance collaboration via technology from services like Microsoft Teams, Power Apps, Power Bi and more to new data share technologies across federal agencies. However, the national security nature of our work can sometimes be at odds with the features. A great example is the restriction of microphone and video capabilities of laptops in SCIFs. OCIO's objective is to reimagine the structure between security requirements and technology enhancements to find a balance for BIS operations while being able to fulfill the mission in the new hybrid work environment of the Federal Government.

Finally, BIS desires to partner effectively for better business. OCIO will continue to collaborate with shared service providers across Commerce Bureaus and Federal Interagency partners on consolidating duplicative or redundant services. This allows increased focus on the mission of BIS. OCIO is leveraging enterprise Network, SOC, O365 & Cloud solutions. Preparations are underway to utilize the upcoming Commerce IDIQ vehicle for IT Support contracting. As well OCIO is engaging in technology pilots for the use of Snowflake and Alteryx to streamline interagency data sharing with agency partners.

Objective 4.1



Co-Location of OCIO Staff

Enhance our CX360 as a good neighbor, building community, and take care of each other.

Objective 4.2



Structure Security and Collaboration Features

Balance BIS's unique security needs around tech enabled collaboration tools.

Objective 4.3



Partnerships Across Services

Leverage Commerce's shared services and interagency collaboration.

Goal 5: Continuous Upskilling

With so much focus on technology's speed of change, balance must be cultivated. The balance to new technology is the human capital to utilize said tech. Deep institutional knowledge exists in BIS alongside critical, non-commercial sector skillsets. Therefore, upskilling is critical to the organization embracing new technology. Without upskilling, upgrades OCIO brings to the table will fall flat, no matter how amazing the technology. OCIO cannot own all upskilling needs, however, it can and should be responsible for general technology implementations. During the O365 and Microsoft Teams roll out we experienced this firsthand with a wide range of comfort levels in adjusting to the software.

OCIO is dedicated to actively planning and budgeting for upskill needs. We view upskilling as a core aspect in the CX360 that needs to be engaging and continuous. To that end, we're looking at two core objectives to ensure OCIO prioritizes continuous learning and upskilling.

First is understanding the skill gap. This gap will need to be assessed across the organization and for each technology. A scalable way of determining the skills gap is needed to optimize technology rollouts. Integrating skillset gap analysis into procurement planning is also critical to successful project completion.

Second is identifying the best form of training. This may come in vendor provided training, online videos, general e-training service, or customized learning. The cost benefit analysis will be based on the skill gap analysis and the efficacy of various types of training. OCIO also plans to have a higher touch involved with training as it retains many technical experts itself. Personnel involved in upskilling helps build bonds within the BIS organization and delivers the high touch CX360.

In conclusion there is an African proverb that BIS-OCIO prescribes too "If you wish to go fast go alone and if you wish to go far...go as a group." This vision document seeks to go far in our quest to help support the growth and evolution of the US Department of Commerce and Bureau of Industry and Security's overarching mission.

Objective 5.1



Understand the Skill Gap

Data based testing of technology skills specific to the user and their needs.

Objective 5.2



Identifying Best In-Class Technology Training

Aligned long term value.

Appendix A: Acronyms

AES	Automated Export System
BIS	Bureau of Industry and Security
CFIUS	Committee on Foreign Investment in the United States
CX360	Omni Customer Experience
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
EA	Export Administration
EAR	Export Administration Regulations
ECRA	Export Control Reform Act
EE	Export Enforcement
IT	Information Technology
MOU	Memorandum of Understanding
NSC	National Security Council
NRC	Nuclear Regulatory Commission
NSPM -7	National Security Presidential Memorandum No. 7
OCIO	Office of Chief Information Officer
SCIF	Sensitive Compartmented Information Facility
SNAP -R	Simplified Network Application Process Re-Design
USG	United States Government